INDOOR AIR QUALITY ASSESSMENT

White Street Elementary School
300 White Street
Springfield, Massachusetts

Prepared by:
Massachusetts Department of Public Health
Bureau of Environmental Health Assessment

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Background/Introduction

At the request of a parent and Lynn Rose from the Western Massachusetts Coalition for Occupational Safety and Health (MassCOSH), the Massachusetts Department of Public Health (MDPH), Bureau of Environmental Health Assessment (BEHA) was asked to provide assistance and consultation regarding indoor air quality at the White Street Elementary School, 300 White Street, Springfield, Massachusetts.

On September 11, 2001, Cory Holmes, Environmental Analyst of the Emergency Response/Indoor Air Quality (ER/IAQ) Program, conducted an indoor air quality assessment. Mr. Holmes was accompanied by John Murphy, school custodian, Judy Dean of the American Lung Association and Ms. Rose during the assessment. Reports of inadequate ventilation, odors, lack of temperature control and other indoor air quality issues prompted the assessment.

The school consists of two separate buildings. The original White Street School is a two-story red brick building constructed in 1906. An annex, also a two-story brick structure, was built in 1934. The original school building contains the main office and general classrooms. The annex contains the nurse's office, library, gymnasium/cafeteria, science lab, offices and general classrooms. During the school day students utilize space in both buildings. Windows in both buildings are openable.

Methods

Air tests for carbon dioxide, temperature and relative humidity were taken with the TSI, Q-Trak, IAQ Monitor, Model 8551.

Results

The school houses kindergarten through fifth grades with a student population of approximately 500 and a staff of approximately 65. Tests were taken under normal operating conditions and results appear in Tables 1-4.

Discussion

Ventilation

It can be seen from the tables that carbon dioxide levels were elevated above 800 parts per million parts of air (ppm) in two of twenty-nine areas surveyed, indicating adequate air exchange in most areas of the school on the day of the assessment. It is important to note however, that the assessment occurred on a warm day (outside temp 84^{o} F). Windows were open in most classrooms, which can greatly contribute to reduced carbon dioxide levels. Further, it would be expected to see elevated carbon dioxide levels (i.e., >800 ppm) during the heating season when exterior doors and windows are normally shut due to the condition of the ventilation system.

As discussed previously, the school is comprised of two buildings that have two different types of ventilation systems. For this reason the ventilation section of this report is divided into two sub-sections.

Original 1906 Building

The original 1906 building does not have an operating mechanical system. The original ventilation system appears to have been intentionally abandoned. Fresh air is provided in the 1906 section building by an air handling unit (AHU) located in a large room on the ground floor that is connected to ductwork leading to air diffusers (see Pictures 1-3). Fresh air is drawn into the building through a vent at the rear of the building. Air is drawn through heating elements into a fan unit that distributes the air via wall mounted fresh air grilles throughout the 1906 section. Classroom fresh air supply grilles are connected to the fan unit by ductwork located in a crawlspace beneath the 1906 section. The fan was not operating during the assessment. In addition, some of the vents were sealed and many were missing or had damaged control mechanisms. The vault at the base of the ventilation shaft was being used as storage.

A corresponding vent exists in each room (see Picture 4) near the classroom doorway that is connected to an exhaust ventilation shaft which runs from the roof to the basement. Classrooms were constructed around these shafts to provide exhaust ventilation.

Depressurization created by the fresh air supply system also provided classroom exhaust ventilation. As mentioned, each classroom is connected by ventilation shafts to the basement beneath the heating elements in a hearth-like structure. As the heating elements draw air into the ducts, return air is drawn from the "hearths" at the bottom of the exhaust ventilation shafts. Negative pressure is created in these shafts, which in turn draw air into the exhaust vents of each classroom. The draw of air into these vents is controlled by a draw chain pulley system. Because this system has been abandoned, no means of mechanical supply or exhaust ventilation exists. Unless the ventilation system is restored to its original design by restoring control systems, openable basement windows and mechanical components, the sole source of ventilation in this building is openable windows.

This building was configured in a manner to use cross-ventilation to provide comfort for building occupants. The building is equipped with windows on opposing exterior walls with hinged windows located above the hallway doors. This hinged window (called a transom) (see Picture 5) enables classroom occupants to close the hallway door while maintaining a pathway for airflow. The design allows for airflow to enter an open window, pass through a classroom and subsequently pass through the open transom. Airflow then enters the hallway, passing through the opposing open classroom transom, into the opposing classroom and finally exits the building on the leeward side (opposite the windward side) (see Figure 1). With all windows and transoms open, airflow can be maintained in a building regardless of the direction of the wind. This system fails if the windows or transoms are closed (see Figure 2). Transoms are opened using a chain/pulley system, some of which appeared operable.

1934 Annex Building

Fresh air in classrooms of this building is supplied by a unit ventilator (univent) system (see Picture 6). Univents draw air from outdoors through a fresh air intake located on the exterior walls of the building (see Picture 7) and return air through an air intake located at the base of each unit (see Figure 3). Fresh air and return air are mixed, filtered, heated and provided to classrooms through a fresh air diffuser located in the top of the unit.

Univents were deactivated in the majority of classrooms surveyed (see Tables). Obstructions to airflow, such as books, papers and posters on top of univents, as well as bookcases, tables and desks in front of univent returns, were seen in a number of classrooms. To function as designed, univents and univent returns must remain free of obstructions. Importantly, these units must be activated and allowed to operate during hours of school occupation. Univents appear to be original equipment (possibly greater than 60 years old). Univents were opened in several classrooms. None of the univents inspected contained filters (see Picture 6).

Exhaust ventilation for this wing consists of non-mechanical exhaust vents located at floor level that are connected by ductwork to wind driven turbine propelled fans on the roof (see Picture 8). Although roof turbines were freely rotating, no draw of air was noted in classrooms, indicating possible blockage of airflow. Mr. Murphy indicated that this was most likely caused by a fault in the flue system, which was inoperable. Without exhaust ventilation, environmental pollutants can build up in the indoor environment and lead to indoor air quality complaints.

To maximize air exchange, the BEHA recommends that both supply and exhaust ventilation operate continuously during periods of school occupancy. In order to have proper ventilation with a univent and exhaust system, the systems must be balanced to provide an adequate amount of fresh air to the interior of a room while removing stale air from the room. The date of the last balancing of these systems was not available at the time of the assessment. It is recommended that existing ventilation systems be re-balanced every five years to ensure adequate air systems function (SMACNA, 1994).

The Massachusetts Building Code requires a minimum ventilation rate of 15 cubic feet per minute (cfm) per occupant of fresh outside air or have openable windows in each room (SBBRS, 1997; BOCA, 1993). The ventilation must be on at all times that the room is occupied. Providing adequate fresh air ventilation with open windows and maintaining the temperature in the comfort range during the cold weather season is impractical. Mechanical ventilation is usually required to provide adequate fresh air ventilation.

Carbon dioxide is not a problem in and of itself. It is used as an indicator of the adequacy of the fresh air ventilation. As carbon dioxide levels rise, it indicates that the ventilating system is malfunctioning or the design occupancy of the room is being exceeded. When this happens a buildup of common indoor air pollutants can occur, leading to discomfort or health complaints. The Occupational Safety and Health Administration (OSHA) standard for carbon dioxide is 5,000 parts per million parts of air (ppm). Workers may be exposed to this level for 40 hours/week, based on a time-weighted average (OSHA, 1997).

The Department of Public Health uses a guideline of 800 ppm for publicly occupied buildings. A guideline of 600 ppm or less is preferred in schools due to the fact that the majority of occupants are young and considered to be a more sensitive population in the evaluation of environmental health status. Inadequate ventilation and/or elevated temperatures are major causes of complaints such as respiratory, eye, nose and throat irritation, lethargy and headaches.

Temperature readings ranged from 75^{o} F to 82^{o} F, which were above the BEHA recommended comfort guidelines in some areas. The BEHA recommends that indoor air temperatures be maintained in a range of 70^{o} F to 78^{o} F in order to provide for the comfort of building occupants. As mentioned previously, the assessment occurred on a warm day. Without air-conditioning, outside air introduced through open windows and/or unit ventilators will roughly equal that of outside temperature. Temperature complaints were expressed in a number of areas, which can also indicate problems with the ventilation system and/or thermostatic control. In addition, temperature control is difficult in an old building with abandoned or nonfunctioning ventilation systems. In many cases concerning indoor air quality, fluctuations of temperature in occupied spaces are typically experienced, even in a building with an adequate fresh air supply.

The relative humidity ranged from 42 to 58 percent, which was within the BEHA recommended comfort range (see Tables). The BEHA recommends a comfort range of 40 to 60 percent for indoor air relative humidity. Of note were basement room B-2 of the original building and the nurse's office in the annex, which had relative humidity measurements 5-9 percent higher than the relative humidity measured outdoors (49%) on the day of the assessment. This increase of relative humidity can be attributed to lack of airflow. Without airflow created by the ventilation system, water vapor from occupants can build up, as demonstrated by these relative humidity measurements. Please note that room B-2 also had a carbon dioxide level in excess of 1,500 ppm, indicating poor air exchange.

Relative humidity in these buildings would be expected to drop below comfort levels during the heating season. The sensation of dryness and irritation is common in a low relative humidity environment. Humidity is more difficult to control during the winter heating season. Low relative humidity is a very common problem during the heating season in the northeast part of the United States.

Microbial/Moisture Concerns

Water-damaged ceiling tiles and wall plaster were observed in several areas of both buildings (see Picture 9), which indicates a current or historic water penetration problem. Efflorescence (i.e., mineral deposits) was observed in room B-4 of the original building. Efflorescence is a characteristic sign of water damage to building materials such as brick or plaster, but it is not mold growth. As moisture penetrates and works its way through mortar around brick, water-soluble compounds in bricks and mortar dissolve, creating a solution. As the solution moves to the surface of the brick or mortar, water evaporates, leaving behind white, powdery mineral deposits. This condition indicates that water from the exterior has penetrated into the building. Water damaged building materials such as wall plaster and ceiling tiles can serve as a medium to support mold growth, especially if wetted repeatedly. Active roof leaks were reported in classroom 18 of the annex.

Of particular note are the conditions of caulking of windowpanes in the annex. Caulking around the interior and exterior of windowpanes is crumbling, missing or damaged throughout the building (see Picture 10). A broken window was noted in classroom 16 and spaces were noted around the window in the first floor reading room (see Picture 11). Many of these rooms had water-damaged windowsills and wall plaster, which is evidence of water intrusion through improperly sealed windows. Repeated water damage can result in mold colonization of the wooden window frames and porous materials. Once mold has colonized these materials, they are difficult to clean and should be replaced.

Plants were noted in several classrooms. Plants can be a source of pollen and mold, which can be respiratory irritants for some individuals. Plants should be properly maintained and equipped with drip pans. Plants should also be located away from univents to prevent the aerosolization of dirt, pollen or mold.

Building staff reported the occasional sound of birds within abandoned ventilation shafts. No obvious evidence of bird infestation was observed in classroom vents during the assessment (e.g., feathers, wastes, nesting materials). BEHA staff examined conditions on the roof for potential pathways of egress for birds into the building. Ventilation shafts terminate on the roof through louvered vents (see Picture 12). While some of the vents were secured with wire mesh to prevent bird egress, several vents were missing screens.

Other Concerns

Several other conditions were noted during the assessment that can affect indoor air quality. Damaged fiberglass insulation was noted in the first floor girls' restroom. Fiberglass insulation can be a source of skin, eye and respiratory irritation to sensitive individuals.

The teachers' room contained a lamination machine and a photocopier. Volatile organic compounds (VOCs) and ozone can be produced by photocopiers, particularly if the equipment is older and in frequent use. Ozone is a respiratory irritant (Schmidt Etkin, D., 1992). Lamination machines can produce irritating odors during use. This area is not equipped with local exhaust ventilation to remove excess heat and odors generated by this equipment.

Accumulated chalk dust was noted in several classrooms. Chalk dust is a fine particulate, which can become easily aerosolized and serve as a source of eye and respiratory irritation. A number of classrooms contained dry erase boards and dry erase board markers. Materials such as dry erase markers and dry erase board cleaners may contain volatile organic compounds (VOCs), (e.g. methyl isobutyl ketone, n-butyl acetate and butyl-cellusolve) (Sanford, 1999). Cleaning products were found on floors, counter-tops and beneath sinks in a number of classrooms. Cleaning products and dry erase board markers and cleaners contain chemicals that can be irritating to the eyes, nose and throat of sensitive individuals.

Also of note was the amount of materials stored inside classrooms. In several areas, items were observed piled on windowsills, tabletops, counters, bookcases and desks. The large number of items stored in classrooms provides a source for dusts to accumulate. These items (e.g., papers, folders, boxes) make it difficult for custodial staff to clean in and around these areas. Dust can be irritating to the eyes, nose and respiratory tract. For this reason, items should be relocated and/or be cleaned periodically to avoid excessive dust build up.

A number of univents had accumulated dirt, dust and debris within their air handling chambers, on coils, fans and other components (see Picture 6). These conditions can be attributed to the fact that no means for inserting filters exist in these univents. In order to avoid univents serving as a source of aerosolized particulates, the air handling sections of the univents should be regularly cleaned. However, without filters, dirt, dust and debris can easily collect within the units.

Various odor complaints were expressed to BEHA staff. Occupants reported food odors from the cafeteria in classroom 18, on the second floor of the annex. The most likely source of these odors was identified as the abandoned exhaust ventilation shafts. If exhaust ventilation is not operating these shafts can serve as pathways for odors to migrate.

Mechanical exhaust ventilation in some restrooms was not functioning during the assessment. The vent in the basement restroom of the original building had corroded to the point of disintegration (see Picture 13). Exhaust ventilation is necessary in restrooms to remove moisture and to prevent restroom odors from penetrating into adjacent areas.

Conclusions/Recommendations

The solution to the indoor air quality problem at the White Street Elementary School is somewhat complex. The combination of the general building conditions, maintenance, work hygiene practices and the condition (or lack) of HVAC equipment, if considered individually, present conditions that could degrade indoor air quality. When combined, these conditions can serve to further negatively affect indoor air quality. Some of these conditions can be remedied by actions of building occupants. Other remediation efforts will require alteration to the building structure and equipment. For these reasons a two-phase approach is required, consisting of **short-term** measures to improve air quality and **long-term** measures that will require planning and resources to adequately address the overall indoor air quality concerns.

The following **short-term** measures should be considered for immediate implementation:

1. Examine each univent for function. Survey classrooms for univent function to ascertain if an adequate air supply exists for each room. Consider consulting a heating, ventilation and air conditioning (HVAC) engineer concerning the calibration of univent fresh air control dampers throughout the school.
2. Remove all blockages from univents to ensure adequate airflow. Clean out interiors of univents regularly. Have univents examined by an HVAC engineering firm to determine if univents can be fitted for filters.
3. Have HVAC engineer examine exhaust vents in the annex for function and activate if operable.
4. To maximize air exchange, the BEHA recommends that the ventilation system operate continuously during periods of school occupancy independent of classroom thermostat control.
5. If original mechanical ventilation systems are not fully restored in the original building, ensure abandoned exhaust and supply vents are properly sealed to eliminate pathways for movement of odors and particulates into occupied areas.
6. Regulate airflow in classrooms by using openable windows to control for comfort. Care should be taken to ensure windows are properly closed at night and weekends to avoid the freezing of pipes and potential flooding.
7. For buildings in New England, periods of low relative humidity during the winter are often unavoidable. Therefore, scrupulous cleaning practices should be adopted to minimize common indoor air contaminants whose irritant effects can be enhanced when the relative humidity is low. To control for dusts, a high

efficiency particulate arrestance (HEPA) filter equipped vacuum cleaner in conjunction with wet wiping of all surfaces is recommended. Avoid the use of feather dusters. Drinking water during the day can help ease some symptoms associated with a dry environment (throat and sinus irritations).

8. Ensure exhaust ventilation shafts are properly secured with screens on the roof of the original building and inspect periodically to prevent occupation by birds and other pests.
9. Repair/replace broken windowpanes in classroom 16.
10. Ensure plants have drip pans. Examine drip pans periodically for mold growth and disinfect with an appropriate antimicrobial where necessary.
11. Regularly inspect all roof and exterior drains to ensure proper drainage.
12. Consider relocating photocopiers and lamination machines to a well-ventilated area or examine the feasibility of installing local exhaust ventilation.
13. Relocate or consider reducing the amount of materials stored in classrooms to allow for more thorough cleaning of classrooms. Clean items regularly with a wet cloth or sponge to prevent excessive dust build-up.
14. Encapsulate exposed pipe insulation to avoid the aerosolization of fiberglass fibers.
15. Store chemicals and cleaning products properly and out of the reach of students.
16. Clean chalkboards and trays regularly to prevent the build-up of excessive chalk dust.

The following **long-term measures** should be considered:

1. Based on the age, physical deterioration and availability of parts for ventilation components, the BEHA strongly recommends that an HVAC engineering firm fully evaluate the ventilation systems of both buildings.
2. Examine the feasibility of providing mechanical supply and exhaust ventilation in the original building. Determine if existing airshafts, vents, ductwork, etc. can be retrofitted for (modern) mechanical ventilation.
3. Consider restoring/repairing transoms to working order to enhance airflow during warm weather. Be sure to close transoms at the end of the school day. To aid in the draw of fresh outdoor air in warm weather, use portable fans directing air out windows on the leeward side of the building. Fans positioned in this manner will serve to increase the draw of outdoor air across a floor without interfering with the natural internal airflow pattern of the building. To aid cross ventilation, open hallway doors in areas with inoperable transoms.
4. Thermostat settings throughout the school should be evaluated. Thermostats should be set at temperatures to maintain comfort for building occupants.
5. Repair any existing water leaks and replace any remaining water-stained ceiling tiles, wooden windowsills and wood trim. Examine the areas above and around these areas for mold growth. Disinfect areas of water leaks with an appropriate antimicrobial as needed.
6. Replace missing or damaged window caulking building-wide (annex) to prevent water penetration through window frames.

7. Consider having exterior brick repointed and waterproofed to prevent further water intrusion. Repair/replace water-damaged plaster. Examine surrounding non-porous areas for mold growth and disinfect with an appropriate antimicrobial if necessary.

References

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Schmidt Etkin, D. 1992. Office Furnishings/Equipment & IAQ Health Impacts, Prevention & Mitigation. Cutter Information Corporation, Indoor Air Quality Update, Arlington, MA.

SMACNA. 1994. HVAC Systems Commissioning Manual. 1st ed. Sheet Metal and Air Conditioning Contractors' National Association, Inc., Chantilly, VA.

Figure 1 **Cross Ventilation in a Building Using Open Windows and Transoms**

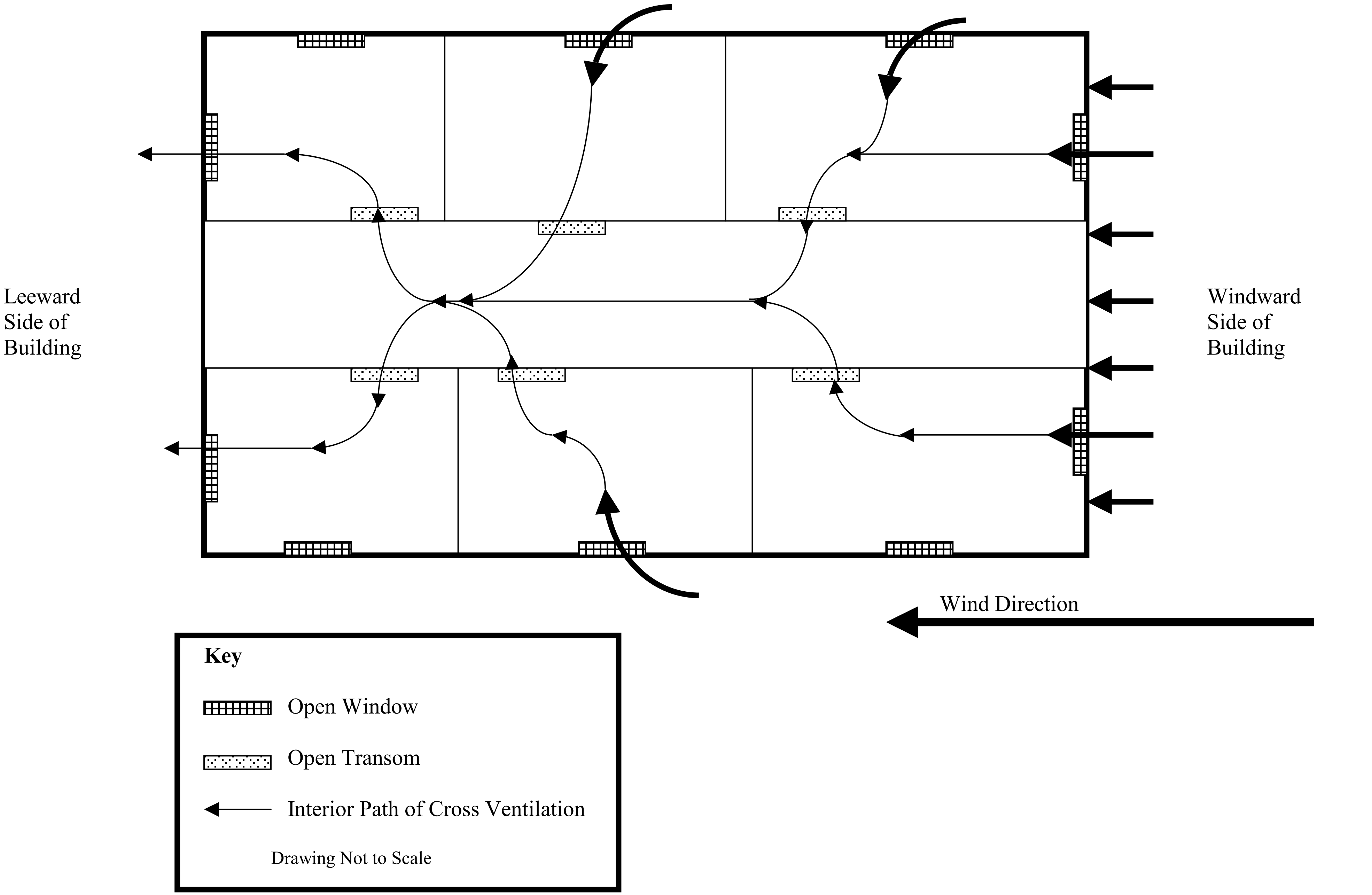
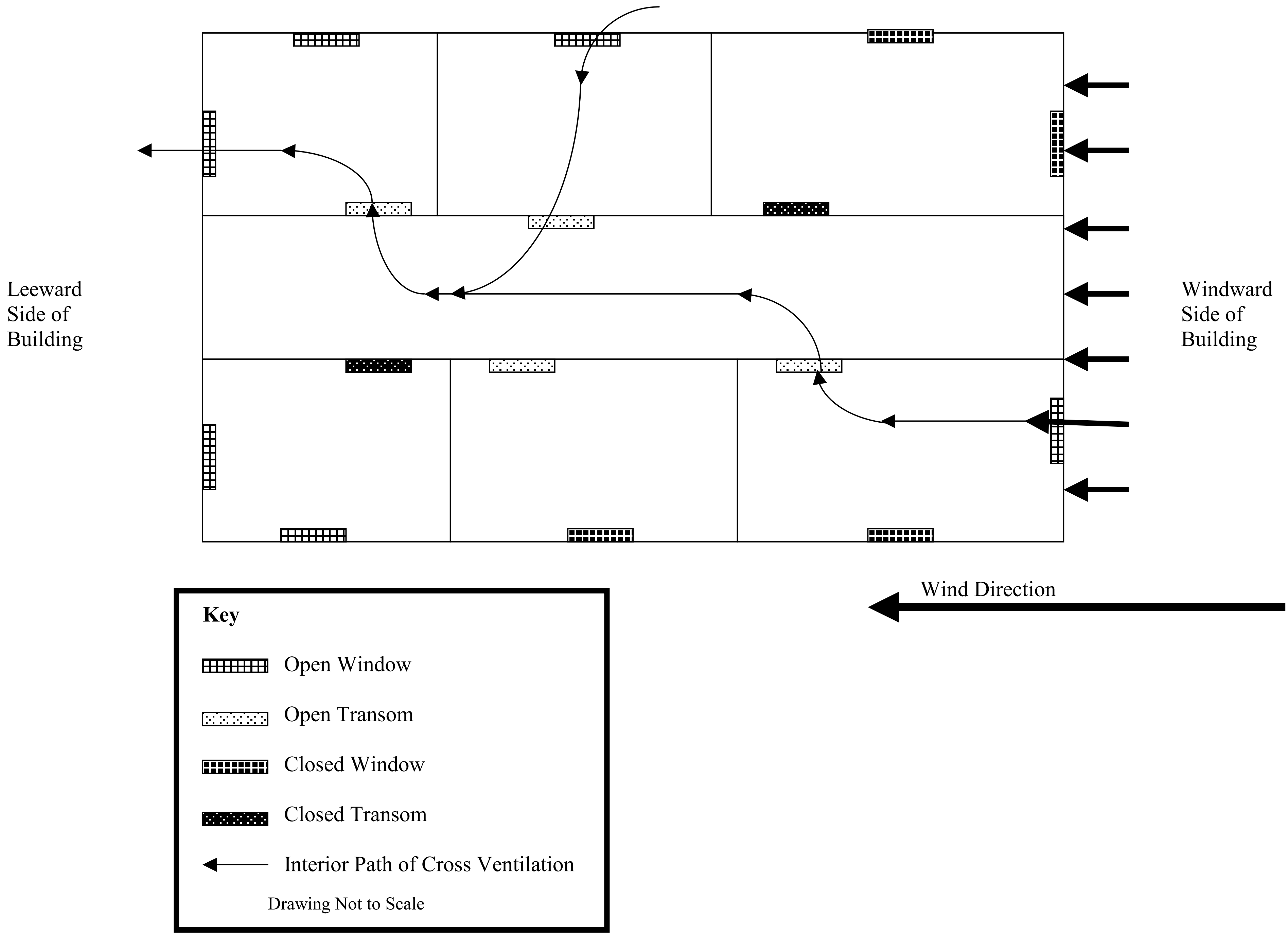


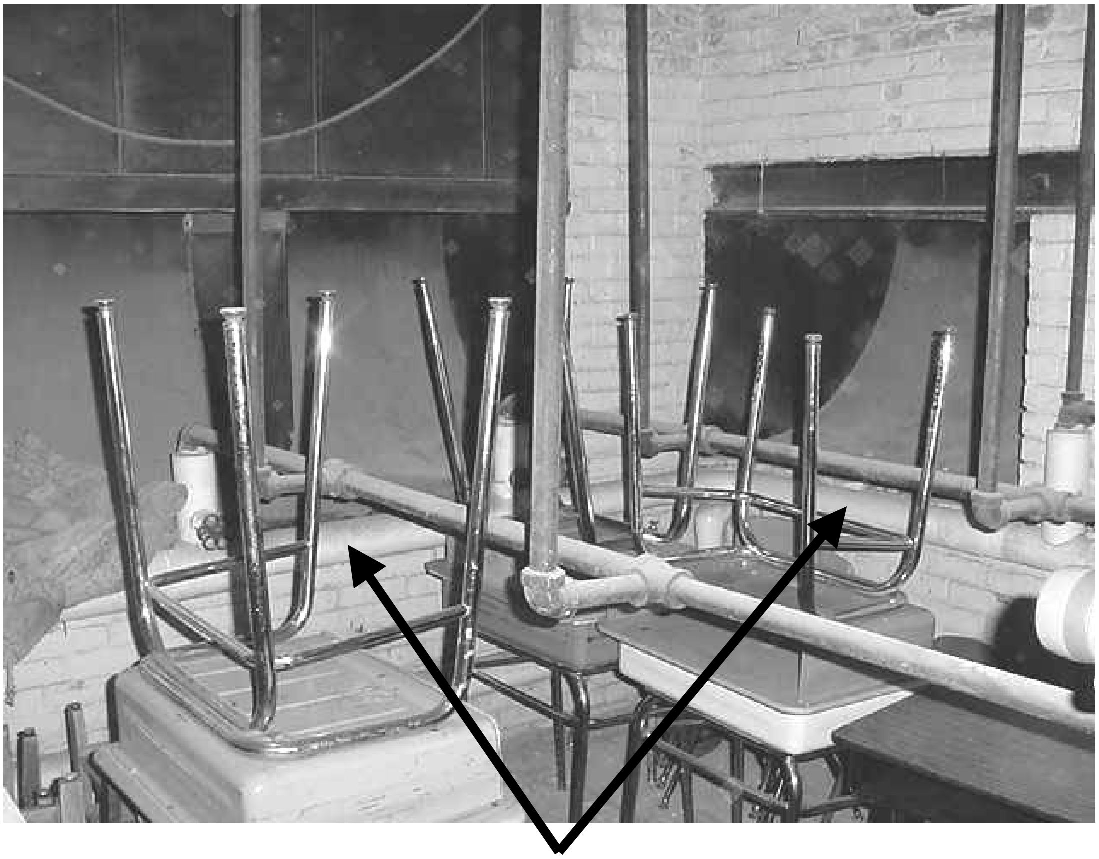
Figure 2 **Inhibition of Cross Ventilation in a Building with Several Windows and Transoms Closed**



Picture 1

Supply Vent for Abandoned Mechanical Ventilation System in 1906 Building

Picture 2

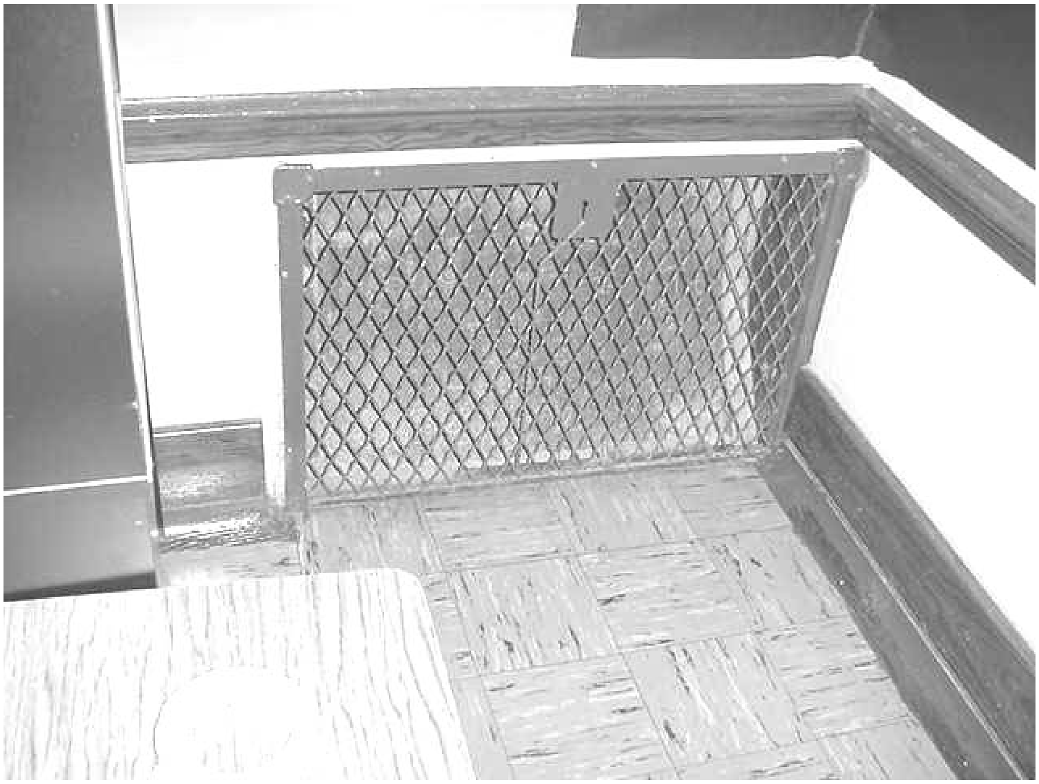


Ventilation Shafts in Basement, Area Now Used for Storage

Picture 3

Fan for Mechanical Ventilation System in the 1906 Building

Picture 4



Supply Vent for Abandoned Mechanical Ventilation System in the 1906 Building

Picture 5

Transom/Window System in 1906 Building, Note Pull Chain Mechanism on Side

Picture 6

Interior of 1934 (Annex) Building Univent, Note Lack of Filter and Accumulation of Dirt, Dust and Debris

Picture 7

Univent Fresh Air Intake

Picture 8

Wind-Driven Turbine Exhaust Vent on 1934 (Annex) Building Roof

Picture 9

Water-Damaged Ceiling Plaster and Peeling Paint

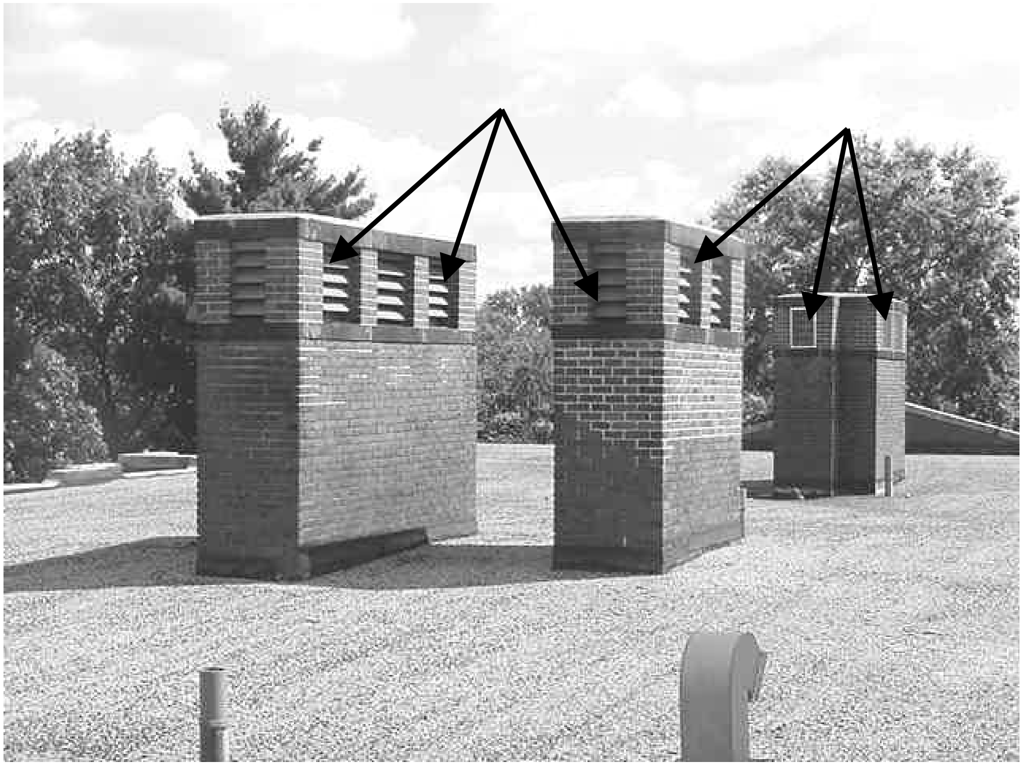
Picture 10

Pieces of Damaged Window Caulking on Water Damaged Window Sill in 1934 (Annex) Classroom

Picture 11

Spaces around Window in First Floor Reading Room of 1934 (Annex) Building, Note Window was Closed at Time of Photo

Picture 12



Rooftop Exhaust Vents, Many of which were not Secured with Wire Mesh to Prevent the Occupation of Birds/Pests

Picture 13

Missing Exhaust Vent in Basement Restroom of the 1906 Building

TABLE 1

Indoor Air Test Results – White Street Elementary School, Springfield, MA – September 11, 2001
1934 Building

Location	Carbon Dioxide *ppm	Temp. °F	Relative Humidity %	Occupants in Room	Windows Openable	Ventilation		Remarks
						Intake	Exhaust	
Outside (Background)	432	84	49					
Room 5	688	80	45	16	Yes	Yes	Yes	Window and door open, water-damaged ceiling, chalk dust
Room 6	689	80	44	23	Yes	Yes	Yes	Window open, reports of pigeons, damaged floor tiles
Teachers' Room 11	688	81	45	1	Yes	No	No	Window open, restroom fan broken, soiled carpet, refrigerator/soda machine on carpet, photocopier
Room 7	740	80	45	26	Yes	Yes	Yes	Window open
Room 10	641	80	43	27	Yes	Yes	Yes	Window open, transoms
ESL Room	656	80	45	2	Yes	No	No	
Room 8	739	80	47	35	Yes	Yes	Yes	Window open
Room 9	610	80	43	24	Yes	Yes	Yes	Window and door open, water-damaged ceiling, cleaning products/paint

*** ppm = parts per million parts of air**
CT = ceiling tiles

Comfort Guidelines

Carbon Dioxide -	< 600 ppm = preferred
	600 - 800 ppm = acceptable
	> 800 ppm = indicative of ventilation problems
Temperature -	70 - 78 °F
Relative Humidity -	40 - 60%

TABLE 2

Indoor Air Test Results – White Street Elementary School, Springfield, MA – September 11, 2001
1934 Building

Location	Carbon Dioxide *ppm	Temp. °F	Relative Humidity %	Occupants in Room	Windows Openable	Ventilation		Remarks
						Intake	Exhaust	
Room B-4	1079	80	48	24	Yes	Yes		Window open, efflorescence-bricks, water-damaged ceiling, hole-insect egress
Basement Restroom					Yes	Yes	Yes	Exhaust weak-vent rotted out
Mechanical Room								Large fan, heating element, dirty/dusty storage
Room B-2	1540	78	58	21	Yes	No	No	Chalk dust
Room 4	719	79	46	19	Yes	Yes	Yes	Window open, vent sealed
1st Floor Restroom (near room 4)							Yes	Water-damaged walls, tile peeling, could not determine if exhaust was operational
Room 3	529	79	43	20	Yes	Yes	Yes	Window open
Room 1A	510	79	42	18	Yes	Yes	Yes	Window open
Room 2	512	80	43	2	Yes	Yes	Yes	Window open

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TABLE 3

Indoor Air Test Results – White Street Elementary School, Springfield, MA – September 11, 2001
1934 Building

Location	Carbon Dioxide *ppm	Temp. °F	Relative Humidity %	Occupants in Room	Windows Openable	Ventilation Intake	Ventilation Exhaust	Remarks
Nurse's Office	511	75	54	3	Yes	No	No	Window open, peeling paint, urine odor complaints in restroom, wall switch activated exhaust fan
Room 15	490	79	46	0	Yes	Yes	Yes	Window open, dirt/dust/debris, books on chalk tray-difficult to clean
2nd Floor Restroom					Yes	No	No	Window closed
Room 16	422	79	44	0	Yes	Yes	Yes	Window open, broken window-glass on sill, water-damaged ceiling plaster
Room 17	509	80	40	17	Yes	Yes	Yes	Window and door open, water-damaged ceiling, plants
Room 18	712	82	47	22	Yes	Yes	Yes	Window open, exhaust vent open, active roof leak, food odors
Councilor's Office	609	82	45	0	Yes	No	No	Window open, heat/restroom odor complaints
Room 14	608	82	44	24	Yes	Yes	Yes	Window open
1st Floor Girls' Restroom						No	No	Damaged fiberglass insulation
1st Floor Reading Room	587	81	45	0	Yes	No	No	Spaces around window-closed

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Relative Humidity -	40 - 60%

TABLE 4

Indoor Air Test Results – White Street Elementary School, Springfield, MA – September 11, 2001
1934 Building

Location	Carbon Dioxide *ppm	Temp. °F	Relative Humidity %	Occupants in Room	Windows Openable	Ventilation		Remarks
						Intake	Exhaust	
Room 13	565	80	42	1	Yes	Yes	Yes	26 occupants gone ~10 min., window open, pesticide/cleaning product on floor
Room 12	446	80	43	1	Yes	Yes	Yes	25 occupants gone ~10 min., window and door open, water-damaged ceiling/wall plaster
Library	464	80	44	1	Yes	Yes	Yes	Windows open, books covered with dust, storage, dust/dirt through windows
Science Lab	453	79	45	1	Yes	No	Yes	Wall mounted exhaust fan- switch activated, window open
Teachers' Workroom					Yes	No	No	Window open, lamination machine, photocopier
Teachers' Lounge	535	80	45	6	Yes	N	No	Window open
Gym/Cafeteria	683	80	46	~50	Yes	No	No	Windows open

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